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NEW PEDICULATE FISHES FROM THE PHILIPPINE  
ISLANDS AND CONTIGUOUS WATERS.

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In the present paper are described a new genus and 16 new species of pediculate fishes collected by the U. S. Fisheries steamer *Albatross* on the Philippine expedition. All of the species described are herein represented by illustrations made from drawings or photographs. The types have been deposited in the United States National Museum.

Family LOPHIIDÆ.

**SLADENIA REMIGER** Smith and Radcliffe, new species.

Plate 16, fig. 1.

Dorsal II-I, 10; caudal 8; anal 7; ventral i, 5; pectoral 20.

Head large, arched, less depressed than in other lophiids, length measured to anterior margin of gill-opening 2.54 in total length, breadth 1.12 in its length (2.85 in total length), depth 1.54 in its length; body tapering, deeper than broad, ventral surface a little flattened; caudal peduncle short, deep, depth 4.50 in head, length 4.91; eye 6, small, 1.33 in snout; snout 4.50, lateral depressions shallow; mouth moderate, lower jaw projecting about two-thirds diameter of eye beyond upper; maxillary 2.16, reaching vertical from posterior margin of eye; mandible 1.66; nasal tube well developed, apertures opposite one another, the posterior not opening on tip of tube as in *Lophiodes*, upper margin bearing several small filaments; interorbital 6.20, nearly as wide as eye, slightly concave, smooth; preorbital spine represented by a slight knoblike structure covered with skin; upper orbital rim armed with a small blunt spine anteriorly and a long slender, sharp spine posteriorly; occipital spine relatively stout; opercular

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<sup>1</sup> In the study of this collection the writer has been associated with Dr. Hugh M. Smith, who becomes joint author of the new genus and species herein described.

bones flexible, humeral spine absent; mandibular teeth few in number, depressible, cardiform, rather small, mainly in two rows, the inner being the larger; two rows of similar teeth, unequal in size, near symphysis of upper jaw, a single series of eight nondepressible teeth on sides of premaxillary; a single canine on each side of vomer and a row of four or five similar teeth on palatines; sides of disk and body with a few small delicate filaments.

First and second dorsal spines close together, near tip of snout, threadlike, their bases overhanging receding edge of lip, first 1.93, second 2.70, the third entirely covered with a loose fold of skin which connects it with the soft dorsal, its base being slightly less than eye diameter from this fin; soft dorsal well developed, its origin much nearer tip of snout than tip of caudal, base 1.74 in head, longest ray 2.70; caudal 1.54, not as broad as long; anal 3.86; pectoral 2.16.

Color in alcohol: Ground color pale drab gray, ventral surface gray, darkest between ventrals and vent; median portion of soft dorsal rays, anal, and ventral surface of pectorals slate-black; caudal slightly dusky; tongue brownish; peritoneum jet black.

*Type*.—Cat. No. 70263, U.S.N.M., 13.7 cm. in length, taken with a beam trawl at station 5605 (lat.  $0^{\circ} 21' 33''$  N.; long.  $121^{\circ} 34' 10''$  E.), in Gulf of Tomini, Celebes, at a depth of 647 fathoms.

This species is distinguished from *S. gardineri* of Regan by the shorter head, ventrals and pectorals; by the presence of only three dorsal spines, the first and second close to tip of snout; by having the caudal longer than deep; and by the well-developed supraorbital spines.

**LOPHIODES OLIVACEUS** Smith and Radcliffe, new species.

Plate 16, fig. 2.

Dorsal II-I-II-8; caudal 8; anal 6; ventral I, 5; pectoral 16.

Head large, subcircular, depressed, disk-like, length measured to anterior margin of gill-opening 2.46 in total length; breadth 1.15 in its length, 2.85 in total length; depth 2.46; body conical, tapering, slightly broader than deep; caudal peduncle slender, depth 8.42 in head, length 5.90; eye large, horizontal diameter 5.36, cornea 6.56; snout 4.30, a deep lateral depression on each side; mouth large, lower jaw projecting about three-fourths diameter of eye beyond upper; maxillary 2.18, reaching vertical from middle of eye; mandible 1.40, extending slightly beyond posterior margin of eye; nasal tube bulbous, close to posterior preorbital spine, apertures located as in related species; interorbital 5.36, equal to eye, concave, rugose; preorbital spines two, rather weak, second stronger; upper orbital rim sharp, overhanging, armed with two blunt teeth anteriorly and a spine-like tooth posteriorly; humeral spine bifid, the two points three-fourths diameter of eye apart, the posterior branch on left side bifid, curved inward and upward, that on the right side single, almost

horizontal; all of bony spines of head relatively short and stout; depressible cardiform teeth mainly in three rows on mandible, inner row longest; similar teeth of unequal size near symphysis of upper jaw, mainly in two rows, a single series of 17 small nondepressible teeth on premaxillary posteriorly, the teeth increasing in size from before backward; a pair of strong canines on each side of vomer and a row of 5 to 7 similar teeth on palatines; well-developed filaments on edge of lower jaw and disk, angle of mouth and sides of head, body, and tail; skin thin, not tough.

Dorsal spines plain bristles, excepting the third, which is scantily fringed; first 1.80 in head, its base close to receding edge of lip; second 2.23, close to first; third 1.34, longest, partly concealed at its proximal end, its base being in vertical to posterior margin of eye; fourth 4.37, slender, concealed for nearly a third of its length, its base midway between tip of snout and base of caudal; fifth 5.90, similar to fourth and close to it; dorsal rays subequal, except first



FIG. 1.—LOPHIODES OLIVACEUS. (FROM THE TYPE.)

and last, which are slightly shorter; caudal nearly truncate, an outer simple ray on each side; anal small, its origin under posterior third of dorsal; ventrals small; pectorals 1.80, well developed, some of posterior rays not discernible without dissection.

Color in alcohol: Dorsal surface olivaceous or sepia, ventral surface light gray, densely dotted with minute black points; fins dusky, ventrals similar in color to ventral surface, pectorals similar to adjacent body color, tips light olive; peritoneum jet black.

*Type*.—Cat. No. 70264, U.S.N.M., 29 cm. in length, taken with a beam trawl at station 5505 (lat.  $8^{\circ} 37' 15''$  N.; long.  $124^{\circ} 36'$  E.), off northern Mindanao, at a depth of 220 fathoms.

This species is very close to *L. micanthus* (Gilbert) from the Hawaiian Islands. In the type and two cotypes of the Hawaiian form the pectoral has 21 or 22 rays, while in the Philippine species it normally has 16, the number varying from 16 to 18; the first dorsal spine is grayish instead of black, and the filamentous flaps are fewer in number and not as well developed.

There are over 50 specimens in the collection taken at depths of 83 to 395 fathoms. Although occasionally found with *L. naresi*, the majority of the specimens were taken from greater depths than our examples of the latter species, which came from depths of 83 to 214 fathoms. *L. naresi* is distinguished from *olivaceus* by the better developed dorsal spines, of which there are six, by the position of the third, its base being between the eyes instead of behind them; by the greater concavity of interorbital; by the better developed bony spines of head, and filaments on head, body, and fins. The posterior arm of the humeral spine is usually single and bent upward; in *L. olivaceus* it is usually multifid.

LOPHIODES INFRABRUNNEUS Smith and Radcliffe, new species.

Plate 16, fig. 3.

Dorsal 11-1-8; caudal 8; anal 6; ventral 1, 5; pectoral 16.

Head large, elliptical, depressed, disklike, length measured to anterior margin of gill-opening 2.62 in total length; breadth 1.21 in head, 3.19 in total length; depth 2.57 in head; body conical, tapering, its

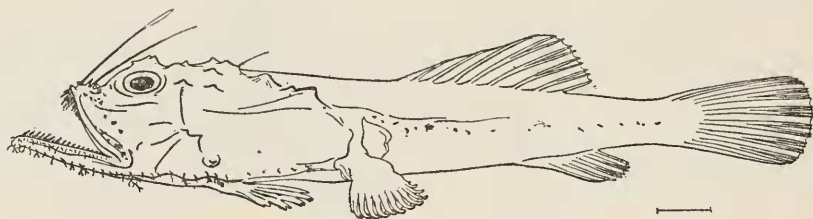


FIG. 2.—LOPHIODES INFRABRUNNEUS. (FROM THE TYPE.)

ventral surface flattened; caudal peduncle tapering, nearly as deep as long, 5.88 in head; eye relatively small, its horizontal diameter 5.64, exposed portion of cornea 7.05; snout 5.02, lateral depressions not as deep as in related species; mouth large, lower jaw projecting; maxillary 2.10, reaching vertical from middle of eye; mandible 1.47, extending beyond posterior margin of eye; nasal tube large, bulbous, anterior aperture large, situated on front of bulb, posterior aperture on apex of tube; interorbital 7.05, deeply concave, smooth; preorbital spines two, anterior weakly bifid, posterior long and sharp; upper orbital rim not very pronounced, armed with three blunt teeth; humeral spine strong, bifid, the two points an eye diameter apart, the posterior spine on the left side being bifid, the one on right side single; all of the bony spines of head low and stout; mandibular and maxillary teeth as in related species, 15 in a single series on sides of premaxillary; a single stout canine on each side of vomer and a row of 4 or 5 similar teeth on each palatine bone; filaments on sides of head and body small, few in number; skin thick and tough.

First dorsal spine 2.56, longest, bearing a narrow flap along distal portion; second 2.64, bristle-like; third 4.70, concealed for half its length at its proximal end, its base midway between tip of upper jaw and posterior edge of gill opening; soft dorsal low; caudal 1.66, long, margin nearly truncate; anal small; ventrals well developed; pectoral 2.43 reaching nearly to base of anal.

Color in alcohol: Dorsal surface yellow-brown, ventral surface anteriorly citron brown, becoming dark mesially and blue-black posteriorly; fins blue-black; inside of mouth brownish; peritoneum blue-black.

*Type*.—Cat. No. 70265, U.S.N.M., 37 cm. in length, taken with a beam trawl at station 5488 (lat.  $10^{\circ}$  N.; long.  $125^{\circ} 6' 45''$  E.), between Leyte and Mindanao, at a depth of 772 fathoms, on a bottom of green mud.

There are 10 specimens in the collection from 9 stations, taken at depths of 270 to 772 fathoms.

This species is distinguished from *L. olivaceus* by the reduced size and number of dorsal spines, the first of which is the longest, the reduced number and size of filaments, the smaller eye, the coloration, especially that of the ventral surface, and the thicker, tougher skin. It normally occurs at a greater depth than the other species of the genus taken in the Philippines. In small examples the dorsal surface is raw sienna, dotted with small light gray spots.

### Family ANTENNARIIDÆ.

*ANTENNARIUS ROSACEUS* Smith and Radcliffe, new species.

Plate 17, fig. 2.

Dorsal III-12; caudal 9; anal 8; ventral 6; pectoral 10.

Head deeper than long, length measured to anterior margin of gill-opening 1.86 (2.53 in total length), breadth 1.25 in its length; body 1.80 (2.45 in total), compressed; caudal peduncle very short, compressed, depth 3.40 in head, length 5; eye 7 in head, 1.31 in snout; snout 6; mouth broad, nearly vertical; lips fleshy; bands of small teeth in jaws and palatines; tongue large, fleshy; maxillary 2.50, nearly concealed under skin, reaching vertical to anterior margin of eye; mandible large, fleshy knob at symphysis well developed; nostrils circular, well separated, with round fleshy rims; interorbital 3.94, depressed, flat; head, body, and fins covered with small excrecences ending in small spinules; pores on head and upper side of back with rough excrecences, very distinct.

First dorsal spine (bait) 1.76, long, slender, bristlelike, ending in a spongy trident, tip reaching beyond middle of third dorsal spine; second spine 1.66, basal third stout, cylindrical, distal portion slender spiral-like, with rough excrecences, and ending in a filament; third

nearly as long as second, a shallow pit in front of it, spine erect, concealed by skin, adnate to top of head; soft dorsal well developed, posterior rays longest 2, base of fin as long as head, fin rounded posteriorly, tips reaching beyond base of caudal, last three rays divided, others simple; caudal 1.50, rounded; anal 2, rounded; ventrals 2.50, short, broad; pectorals 1.10, tips reaching nearly to posterior base of anal.

Color in alcohol: Ground color salmon, ventral surface white; a black ocellus about twice size of eye on base of eighth and ninth dorsal rays and adjacent portion of body; a similar light-colored ocellus margined with dusky brown on upper part of caudal peduncle near base of dorsal; a similar ocellus below and slightly anterior to black blotch; dusky markings on head and body anteriorly, most distinct on tip of third dorsal spine, first and second dorsal rays, and sides between the two and on base of pectoral; soft dorsal bright salmon with dusky markings posteriorly, tips of rays whitish; other fins similar with dusky markings, most distinct near margins; some indistinct dusky lines radiating from eye.

*Type*.—Cat. No. 70266, U.S.N.M., 3.8 cm. in length, from Romblon, taken from ship's side at night, attracted by electric light suspended in water.

**ANTENNARIUS ALTIPINNIS** Smith and Radcliffe, new species.

Dorsal III-12; anal 7; ventral 6; pectoral 9.

Head as deep as long, length measured to anterior margin of gill-opening 1.87 (2.62 in total length), breadth 1.11 in its length; body compressed, its depth 1.76 (2.47 in total length); caudal peduncle short, compressed, depth 2.85 in head, length 5.33; eye 10 in head, 2.50 in snout, very small; snout 4; mouth large, oblique; jaws subequal; maxillary 2.66, partially concealed in skin; nostrils circular, with round fleshy rim; interorbital 3.20, arched; head, body, and fins covered with small excrescences with small spinules at tip; pores on head and back very indistinct.

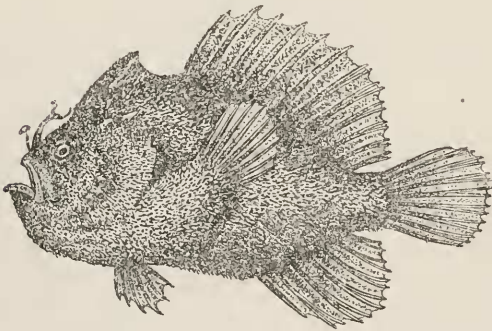


FIG. 3.—*ANTENNARIUS ALTIPINNIS*. (FROM THE TYPE. ENLARGED THREE DIAMETERS.)

First dorsal spine (bait) 6, short, bristlelike, ending in a short spongy club-shaped structure placed at right angles to main axis; second spine 3.60, rather stout, covered with rough excrescences, ending in a filamentous tip which reaches base of third spine; third 2,

adnate to dorsal surface; soft dorsal high, the rays of nearly uniform length, 1.81, base of fin longer than head, the last six rays divided; caudal 1.33, margin rounded; anal 1.81, deep; ventrals 2.16, all of the rays simple; pectorals 1.33, tips reaching beyond insertion of anal.

Color in alcohol: Ground color dark brownish green, shading into purple, scantily mottled with brownish yellow; tips of fins lighter; a black blotch at base of eighth dorsal ray; slight traces of a brownish band across base of caudal.

*Type*.—Cat. No. 70267, U.S.N.M., 2.1 cm. in length, from Nogas Point, Panay, taken in tide pool with copper sulphate.

ANTENNARIUS SUBTERES Smith and Radcliffe, new species.

Plate 17, fig. 1.

Dorsal III-12; anal 7; ventral 5; pectoral 9.

Head as deep as long, length measured to anterior margin of gill-opening 1.80 (2.24 in total length); breadth 1.77 in its length; depth of body 1.80 (2.24 in total length); caudal peduncle long, slender, compressed, depth 5, length 4.33; eye 10 in head, 2 in snout, inconspicuous; snout 5; mouth oblique; jaws subequal; teeth on jaws long, depressible; similar teeth on vomer and palatines; tongue large, fleshy; maxillary 2.60, reaching vertical to middle of eye; nostrils circular, close together, fleshy rim little developed; interorbital 4.33; skin comparatively smooth, slender spinules protruding through in places, most abundant on second and third dorsal spines and ventral surface, those on head and body inconspicuous but noticeable when the finger is passed forward over the body.

First dorsal spine (bait) 5, basal half bristle-like, distal portion enlarged, spongy; second spine 2.80, long, slender, not adnate to dorsal surface, armed with well-developed spinules; third as long as second, adnate to back; dorsal rays small, all except tips covered with a coating of smooth tough skin, last three rays divided; caudal 2.27, narrow, rounded; anal similar to soft dorsal; ventrals 5, very small; pectorals 2.27, small.

Color in alcohol: Ground color purplish brown with yellowish gray mottlings; distal portion of vertical fins dark purplish brown, with light edging; dorsal surface of tongue with gray and brownish mottlings; peritoneum white.

*Type*.—Cat. No. 70268, U.S.N.M., 5.6 cm. in length, taken with a beam trawl at station 5442 (lat. 16° 30' 36'' N.; long. 120° 11' 06'' E.), Lingayen Gulf, west coast of Luzon, at a depth of 45 fathoms, on a bottom of coral sand.

## Family CERATIIDÆ.

## DERMATIAS Smith and Radcliffe, new genus.

Body short, deep, compressed, slightly elevated. Head large, subquadrangular, a long, deep, longitudinal trough on forehead; snout broad and blunt; mouth moderate, nearly horizontal, the mandible projecting but slightly, bearing a strong bifid spine at its posterior end; teeth depressible, cardiform, mainly in one row; vomerine teeth present; no palatine teeth; eyes lateral. Illicium short, two-jointed, the basal joint procumbent; a second nonfunctional dorsal spine on head, entirely concealed by skin, soft dorsal and anal moderate, more or less hidden by skin; caudal large; ventrals absent. Skin naked, very loose, and soft. Gill-openings large, below axil of pectorals.

This genus appears to be more closely related to *Dolopichthys* of Garman than to any of the other ceratiids. The form of head and body and of the illicium and the better developed fins are distinctive.

*Type species.*—*Dermatias platynogaster*.

## DERMATIAS PLATYNOGASTER Smith and Radcliffe, new species.

Plate 17, fig. 3.

Dorsal 1-(1)-7; caudal 9; anal 4; pectoral 15.

General form compressed, irregular, dorsal surface with slight curvature, ventral surface greatly decurved, the very large stomach hanging down like a great pouch; head large, subquadrangular, ridged, its length measured to anterior margin of gill-opening 2.14 (2.90 in total length); body compressed, depth when stomach is empty 1.55 (2.10 in total length); caudal peduncle very deep, depth 2 in head; eye minute, buried beneath a circular patch of transparent unpigmented skin, situated in a broad depression between supra-orbital ridge and premaxillary, its diameter 6.66 in snout; snout 3.19, truncate at tip, as broad as long; mouth moderate, nearly horizontal; maxillary 1.91, reaching considerably beyond vertical from posterior margin of eye; mandible 1.48, projecting but slightly, a fleshy knob below tip, posteriorly ending in a stout bifid spine, the larger spinule curved outward; nasal tube elongate, below level of eye, on anterior prolongation of supraorbital ridge; interorbital 4.85, deeply concave, the longitudinal trough extending from tip of snout nearly to occiput; a preorbital knoblike structure, covered by skin, lies in front of nasal tube, a strong trenchant ridge extends backward over eye, ending in a strong outwardly curved spine; teeth in jaws mainly in one row, depressible, cardiform, those in upper jaw quite irregular; a stout canine on each side of vomer; skin of head and body smooth; gill-opening represented by a broad curved slit, lying below base of pectoral.



Illicium jointed, base being between eyes, basal joint almost entirely concealed, rodlike, procumbent, reaching nearly to tip of snout, distal joint free, 2 in head, the bulblike tip surmounted by many short, fingerlike filaments; second dorsal spine entirely concealed by skin, its base midway between tip of snout and gill-opening, its tip recurved, attached; second dorsal elongate, scarcely separated from caudal, its rays simple, all but tips concealed by skin; caudal base very broad, rays well separated, distal margin rounded; anal similar to second dorsal; membrane connecting caudal rays and tips of dorsal and anal rays very thin, transparent; ventrals absent; pectorals 1.97, rather small, on level with mouth.

Color in alcohol: Ground color seal brown, darkest on belly; caudal light gray, other fins body color; distal joint of first dorsal spine blackish mesially, bulb white with darker shades underneath, filaments white, tipped with black; peritoneum brownish black; stomach mouse gray, dotted with darker; inside of mouth with brownish shades.

*Type*.—Cat. No. 70269, U.S.N.M., 18.2 cm. in length, taken with a beam trawl at station 5463 (lat.  $13^{\circ} 40' 57''$  N.; long.  $123^{\circ} 57' 45''$  E.), near Sialat Point Light, east coast of Luzon, at a depth of 300 fathoms.

#### Family OGCOEPHALIDÆ.

**MALTHOPSIS OCELLATA** Smith and Radcliffe, new species.

Plate 18, fig. 1; plate 19, fig. 1.

Dorsal 5; caudal 9; anal 2; pectoral 12; ventral 5.

Head large, triangular, broader than long, measured to gill-opening 1.88 (2.34 in total length), breadth at base of spine at angle equal to its distance from tip of rostral spine, 1.65 in body; rostral angle about  $72^{\circ}$ ; body conical, tapering, depth 6.30; caudal peduncle slender, depth 7, length 3.36; eye 4.66, large, lateral; snout measured to tip of rostral spine 6.46; mouth small, gape 4.66; jaws subequal; anterior nostril circular, posterior large, slitlike; interorbital 7, concave; skin of dorsal surface with many small dermal ossicles, some of these enlarged, platelike, quite regular in their arrangement, the median dorsal row especially well developed and becoming double within an eye diameter of eye and posteriorly near insertion of dorsal; there are three rows of dermal plates along edge of disk, the upper row dilated near eye, thence curved downward to maxillary; the second extends to gape of mouth, the third meets its fellow below tip of mandible; two well-developed rows along ventral surface behind vent, not interspersed with small ossicles; an area on either side of this row mesially in which the ossicles are scattered or absent; on ventral surface a region in front of ventrals, from between ventrals backward on either side of vent to posterior edge of disk with small dermal plates, rest of ventral surface of disk naked; ros-

tral spine short, nearly horizontal; spiny structure at angle extending outward at right angles to axis of body, covered with ossicles, a well-developed spine at its tip directed forward.

Rostral tentacle short, dilated at tip; dorsal 3.83, base very short, scarcely more than half diameter of eye; caudal 2.21, rounded; anal 3.50, base not equal to diameter of pupil; ventrals equal to caudal; pectorals beyond wrist 2.40.

Color in alcohol: Ground color above wood-brown, with 8 black rings on each side median line of head; ventral surface cream-buff; dorsal dusky, other fins very light cream-buff, almost white; peritoneum silvery.

*Type*.—Cat. No. 70270, U.S.N.M., 9.8 cm. in length, taken with a beam trawl at station 5393 (lat.  $12^{\circ} 03' 30''$  N.; long.  $124^{\circ} 03' 36''$  E.), between Samar and Masbate, at a depth of 136 fathoms, on a bottom of hard sand.

This species is distinguished from *M. lutea* (pl. 18, fig. 2; pl. 19, fig. 2) by the better development of the dermal plates, which are larger and arranged with greater regularity; plates on ventral surface of disk confined to restricted areas; rest of surface smooth; the rostral spine is relatively shorter; spine at posterior angle of disk directed outward, with a forward projecting spinule at tip. In *M. triangularis* (pl. 18, fig. 3; pl. 19, fig. 3) there are more large dermal plates scattered over surface of disk, those on ventral surface much enlarged, the region lying between vent and ventrals entirely paved; rostral spine directed upward, spine at posterior angle ending in four transparent spinules.

This is the most abundant species in the collection, taken at depths of 38 to 425 fathoms. All of the adult specimens have the black rings on dorsal surface; the young do not, though many of them possess brown markings. An isopod infests the branchial region just inside aperture of several specimens.

Color in life of a specimen 7.2 cm. in length from station 5315: Cinnamon brown with a series of three or four black-rimmed ocelli, scarcely as large as pupil, on either side of median ridge; other areas of darker brown present, this giving an obscure mottled effect; ventral region in front of pectorals and ventrals reddish brown.

**HALICMETUS RETICULATUS** Smith and Radcliffe, new species.

Plate 20, fig. 2; plate 21, fig. 2.

Dorsal 3; caudal 9; anal 4; ventral 5; pectoral 12.

Head broader than long, depressed, anterior margin broadly rounded, length measured to anterior margin of gill-opening 1.97, breadth 1.33, depth 2.75 in its length; body short, tapering, length exclusive of caudal 2.03; eye 6.60, small; snout 7.32; mouth small, jaws subequal; villiform bands of teeth on jaws, vomer, palatines

and tongue; maxillary 5.50; nostrils small, in front of rostrum, anterior with a low rim or tube; interorbital 6.71, not as wide as horizontal diameter of eye, flattened, a slight ridge over each eye; rostrum slightly arched, scarcely projecting beyond anterior margin of eye; tentacular cavity small, its width scarcely more than half diameter of eye, illicium with lower lobes united, upper lobe narrow, bifurcate; rostral spine obsolete; lateral spines at angle of disk small, armed with small spinules; tubercles on sides of disk and on body of moderate size, platelike, those on dorsal and ventral surface of disk small, like shagreen; lateral row of plates on disk armed with small spinules; gills two, as in *Malthopsis*.

Dorsal represented by three small rays, its origin considerably nearer tip of caudal than tip of snout; caudal 2.54, well developed; anal small, its base entirely behind base of dorsal; ventrals 3.30, moderate; pectorals 2.27, short.

Color in alcohol: Ground color light olive brown, crossed by narrow light-colored reticulating lines, bars, and spots; ventral surface and fins cream buff.

Color in life: Pale olive with a reddish wash, reticulating lines white.

*Type*.—Cat. No. 70271, U.S.N.M., 7.8 cm. in length, taken with a beam trawl at station 5118 (lat. 13° 48' 45" N.; long. 120° 41' 51" E.), off Sombbrero Island, southern Luzon, at a depth of 159 fathoms, on a bottom of dark green mud.

This species is easily distinguished from *H. ruber* (pl. 20, fig. 3; pl. 21, fig. 3) by the broader, more bluntly rounded and depressed disk (in individuals of the same length the disk in *H. ruber* is only about three-fourths as wide as in this species). The dorsal consists of two or three small, slender rays. In our examples of *H. ruber* no rays are visible on the surface. Brauer,<sup>1</sup> however, records specimens having two or three small dorsal rays.

There are five examples in the collection 5.4 to 7.8 cm. in length from depths of 159 to 200 fathoms.

HALIEUTOPSIS VERMICULARIS Smith and Radcliffe, new species.

Plate 20, fig. 1; plate 21, fig. 1.

Dorsal 5; caudal 9; anal 4; ventral 5; pectoral 15.

Head broad, depressed, subcircular, length measured to anterior margin of gill-opening 1.73, breadth 1.56, depth 2.92 in its length; body short, slender, tapering, its length exclusive of caudal 2.38; eye 6.30, small; snout 6.10; mouth moderate, jaws subequal; narrow bands of villiform teeth on jaws, palate and tongue edentulous; maxillary 4.30; nostrils moderate, lying in a depression on lower

<sup>1</sup> Brauer, Die Tiefsee-Fische, 1906, p. 327.

anterior margin of rostrum, anterior with a raised margin, the two separated by a very thin membrane; interorbital 7, flat, narrower than eye; rostrum arched, projecting beyond jaws for a distance equal to two-thirds diameter of eye; tentacular cavity large, as wide as eye, illicium protractile, ending in two large globular lobes and a narrow bifurcate structure; rostral spine moderate, pointing obliquely upward and forward; dorsal surface with stellate tubercles, each capped with a long slender spine; scattered among the larger tubercles are smaller ones; the large tubercles on the sides of the disk are capped with bifid or trifid spinules; ventral surface of disk naked except for a few tubercles on area between base of pectorals and vent; gills two.

Dorsal well developed, its origin midway between middle of eye and tip of caudal, longest ray 3.47; caudal 2.15, margin rounded; origin of anal under posterior base of dorsal, longest ray 3.31; ventrals 2.60; pectorals 2.15.

Color in alcohol: Ground color olive gray with olive vermiculations; no vermiculations on ventral surface.

Color in life: Ground color bottle green tinged with olivaceous, vermiculations dusky.

*Type*.—Cat. No. 70272, U.S.N.M., 8 cm. in length, taken with a beam trawl at station 5365 (lat.  $13^{\circ} 44' 24''$  N.; long.  $120^{\circ} 45' 30''$  E.), in Balayan Bay, Luzon, in 214 fathoms.

DIBRANCHUS STELLIFER Smith and Radcliffe, new species.

Plate 22, fig. 2; plate 23, fig. 2.

Dorsal 6; caudal 9; anal 4; ventral 5; pectoral 15.

Head not as broad as long, elliptical, disk moderately arched, length measured to anterior margin of gill-opening 1.82, breadth 1.92, depth 2.30 in its length; body moderate, tapering, length exclusive of caudal 2.22; eye 5.58 in head, 1.57 in interorbital; snout 4.88; mouth moderate, jaws subequal; narrow bands of villiform teeth on jaws; palate and tongue edentulous; maxillary 3.90; nostrils large, a thin membranous arch separating the two apertures; interorbital 3.54, broad, flat; rostrum high, scarcely projecting beyond jaws, its edges vertical; tentacular cavity large, higher than wide, its height equal to diameter of eye; illicium protractile, ending in two large globular lobes and a narrow bifurcate lobe; dorsal surface covered with stellate tubercles, those on anterior part of head and sides of body largest, each capped with a long slender spine, those on sides of disk bifid, rostral spine and spines at angles of disk small, not much larger than those along sides of disk, those on ventral surface small, scattered; gills two.

Fins well developed; insertion of dorsal midway between tip of rostrum and tip of caudal, longest dorsal ray 3.54; caudal 2.05 (4.73

in total length), elongate, margin rounded; anal 3.54, its insertion under or slightly behind posterior base of dorsal; ventrals 2.93; pectorals 1.85, reaching nearly to caudal.

Color in alcohol: Dusky olivaceous; caudal margined with blackish above and below, basal portion of median rays white, becoming sepia distally; other fins brownish black.

*Type*.—Cat. No. 70273, U.S.N.M., 9 cm. in length, taken with a beam trawl at station 5660 (lat.  $5^{\circ} 36' 30''$  S.; long.  $120^{\circ} 49' 00''$  E.), in Flores Sea, off the coast of Celebes, at a depth of 692 fathoms, on a bottom of gray mud and sand.

From *D. nasutus* (pl. 22, fig. 3; pl. 23, fig. 3) this species differs in having the disk narrower, much more elevated and heavier, and the framework much less cartilaginous.

DIBRANCHUS SIMULUS Smilh and Radcliffe, new species.

Plate 22, fig. 1; plate 23, fig. 1.

Dorsal 6; caudal 9; anal 4; ventral 5; pectoral 15.

Head not as broad as long, elliptical; disk rather strongly arched, length measured to anterior margin of gill-opening 1.58, breadth 1.71, depth 2.56 in its length; body, exclusive of caudal, 2.71, rather short; eye 5.82, lateral; snout 4.55; mouth large, jaws subequal; teeth on jaws villiform; palate and tongue edentulous; maxillary 3.72; nostrils conspicuous, on anterior margin of rostrum, a thin membranous arch separating the two apertures; interorbital 3.28, broad, slightly arched; rostrum moderate, projecting beyond jaws, the anterior margin bent downward until the tentacular aperture is barely equal to diameter of eye, its height being about one-half its width; the tentacular cavity extending backward nearly to middle of eye; from its posterior base springs the illicium, which is projected forward, reaching the tentacular aperture, tip trilobate, each lobe composed of a mass of spongy filaments; tubercles stellate, relatively small, unequal, each capped with a long slender spine; tubercles on rostrum, sides of disk and body not so well developed as in related species; spines on rostrum and at angles of disk obsolete; ventral surface of disk naked, except for a few small tubercles in axil of pectoral; tubercles on dorsal surface of body small, widely separated, a distinct naked area around gill-aperture; gills two.

Fins well developed; insertion of dorsal midway between anterior margin of eye and tip of caudal, longest ray 3.42; caudal 1.95, distal margin truncate; base of anal entirely behind base of dorsal, longest ray 3.72; ventrals 3.16, well developed; pectorals 2.05, tips reaching half way between posterior base of anal and base of caudal.

Color in alcohol: Light olivaceous; ventral surface white, washed with vinaceous buff; anal, ventral and lower base of pectoral, white; rest of fins dusky.

*Type*.—Cat. No. 70274, U.S.N.M., 8.6 cm. in length, taken with a beam trawl at station 5283 (lat. 13° 48' 30'' N.; long. 120° 28' 40'' E.), near Malavatuan Island, southern Luzon, at a depth of 280 fathoms, on a bottom of dark gray sand.

This species agrees with *D. nudiventer* of Lloyd in having the ventral surface of disk nearly devoid of tubercles, but differs markedly in form. The armature is weak, and the subopercular processes and rostral spine are obsolete, as in *Dibranchopsis* of Garman.

#### Genus CŒLOPHRYIS Brauer.

Under this genus we have included those species characterized by the posterior position of the branchial aperture and short body; the head more arched and less disk-like than in the typical *Dibranchus*; the tubercles in most species small, prickle-like, giving the fish a furry appearance; the ventrals small. Its differences from *Dibranchus* are so slight as to suggest the necessity of degrading it to sub-generic rank. *Dibranchus micropus* Alcock (pl. 26, fig. 1; pl. 27, fig. 1) should be included in the genus.

#### CŒLOPHRYIS MOLLIS Smith and Radcliffe, new species.

Plate 24, fig. 1; plate 26, fig. 5; plate 27, fig. 5.

Dorsal 6; caudal 9; anal 4; ventral 5; pectoral 15.

Head large, subcircular, its length measured to anterior margin of gill-opening 1.38, breadth equal to length, depth 2.10 in its length; body short, slender, tapering; length exclusive of caudal 3.63; eye 4.66, large; snout 3.50, broad; mouth large, nearly horizontal, jaws subequal; teeth in jaws villiform; palate and tongue edentulous; maxillary 3; nostrils small, on side of rostrum opposite middle of eye; interorbital 3, broad, depressed; rostrum depressed, truncate; tentacular cavity as wide as interorbital, low, and shallow; illicium protactile, tipped with two lateral lobes and a broad, fleshy flap above; tubercles small, closely packed, apical prickles elongate; those along edge of disk Y-shaped; tubercles on ventral surface slightly smaller, apical prickles shorter.

Insertion of dorsal nearer tip of snout than tip of caudal, rays very slender; caudal 2.10, narrow; base of anal not entirely behind base of dorsal, rays slender; ventrals 5.23, very small; pectorals 2.47, more than double the length of ventrals, tips reaching beyond base of caudal.

Color in alcohol: Cream white; edges of disk, margin of gill-opening, lower base of pectorals dusky black; ventrals blackish, tips whitish.

*Type*.—Cat. No. 70275, U.S.N.M., 3.9 cm. in length, taken with a beam trawl at station 5348 (lat. 10° 57' 45'' N.; long. 118° 38' 15'' E.), in Palawan Passage, at a depth of 375 fathoms, on a bottom of coral sand.

## CŒLOPHRYS ARCA Smith and Radcliffe, new species.

Plate 24, fig. 2; plate 26, fig. 4; plate 27, fig. 4.

Dorsal 5; caudal 9; anal 4; ventral 5; pectoral 15.

Head box-shaped, widest in front of pectoral base, strongly arched, length measured to anterior margin of gill-opening 1.23, breadth 1.47, its depth 1.71 in its length; body very short, the whole fish having the general appearance of some of the trunk-fishes; length of body exclusive of caudal 5.36; eye 5.33, large, lateral; snout 4.80, broad; mouth large, slightly oblique, jaws subequal; villiform teeth on jaws; palate and tongue edentulous; maxillary 3; nostrils prominent, on level of lower half of eye, anterior aperture tubular, posterior slit-like; interorbital 2.28, broad, depressed, extending obliquely downward to broad truncate margin of rostrum; incised truncate front margin of rostrum in vertical to tip of jaws, angles projecting slightly; the low tentacular cavity wider than eye, extending backward to posterior margin of pupil; illicium short, protractile, reaching scarcely more than half way to aperture, median lobe ending in a bifurcate tip; tubercles stellate, fewer than in related species, the prickles being so much farther apart that the furry appearance is largely lost; prickles on lateral plates mostly bifid, those on ventral surface small, separate.

With the exception of the ventrals, the fins are well developed; insertion of dorsal midway between posterior margin of eye and tip of caudal, longest ray 3.87; caudal 2.28, margin rounded; anal scarcely separated from caudal, longest ray 3.87; ventrals 6.86, poorly developed, less than a third of the length of pectorals; pectorals 2.18.

Color in alcohol: Creamy; tubercular spines along edge of disk and basal two-thirds of ventrals blackish.

*Type*.—Cat. No. 70276, U.S.N.M., 4.1 cm. in length, taken with a beam trawl at station 5295 (lat. 13° 33' 15" N.; long. 121° E.), in Verde Island Passage, near Escarceo Point, at a depth of 231 fathoms, on a bottom of gray sand.

## CŒLOPHRYS BREVIPES Smith and Radcliffe, new species.

Plate 25, fig. 2; plate 26, fig. 2; plate 27, fig. 2.

Dorsal 6; caudal 9; anal 4; ventral 5; pectoral 13.

Head long, strongly arched, greatest breadth equaling the greatest depth, length measured to anterior margin of gill-opening 1.24, breadth 1.80; body very short, length exclusive of caudal 4.62; eye 4.83, large, lateral; snout 4.14, narrow; mouth large, horizontal, jaws subequal; villiform teeth on jaws; palate and tongue edentulous; maxillary 3.22; nostrils well developed, on level with lower half of eye, apertures separated by a thin membranous skin; interorbital 2.90, convex; tentacular aperture large, nearly as high as long, its width equaling horizontal diameter of eye, cavity spacious, extend-

ing backward to posterior margin of eye; the trilobate tip of illicium entirely closing tentacular aperture, the two lower lobes thick and fleshy, the upper thinner, membranous, with a series of short filaments along its outer edge; skin soft, covered with small prickles.

Insertion of dorsal nearer tip of caudal than posterior margin of eye, its base nearly reaching base of caudal; caudal 1.93; anal small, its base nearly reaching base of caudal; ventrals 6.44, small, slightly more than one-third length of pectorals; pectorals 2.23.

Color in alcohol: Anterior half of head, body behind gill-openings, vertical fins and pectorals cream color; rest of head clove brown, darkest on ventral surface; basal half of ventrals brown, tips white; a slight brownish shade on anterior pectoral rays distally.

*Type*.—Cat. No. 70277, U.S.N.M., 5.1 cm. in length, taken with a beam trawl at station 5658 (lat.  $3^{\circ} 32' 40''$  S.; long.  $120^{\circ} 31' 30''$  E.), Gulf of Boni, Celebes, at a depth of 510 fathoms, on a bottom of gray mud.

This species closely resembles *C. brevicaudata* of Brauer, but differs in having the head much shorter and deeper. The collection contains a single other example from station 5238, east coast of Mindanao, taken at a depth of 380 fathoms, on a bottom of green mud.

**CŒLOPHRYX OBLONGA** Smith and Radcliffe, new species.

Plate 25, fig. 1; plate 26, fig. 3; plate 27, fig. 3.

Dorsal 5; caudal 9; anal 4; ventral 5; pectoral 15.

Head narrow, elongate, not disk-like, nearly as high as wide, length measured to anterior margin of gill-opening 1.55, breadth 2.93 (1.89 in its length), depth 2.22 in its length; body tapering, its breadth at gill-opening about one-half breadth head at base of pectoral, its length exclusive of caudal 2.82; eye 7, small; snout 4.90; mouth large, oblique, jaws subequal; teeth in jaws villiform; palate and tongue edentulous; maxillary 3.26; nostrils small, on anterior margin of rostrum opposite middle of eye; interorbital 4.23, broad, flat; rostrum very small, not elevated; tentacular cavity very small and shallow, trilobate tip of illicium entirely closing the aperture; tubercles small, closely packed, each capped with a long slender prickle; those along margin of disk bifid or multifid; prickles so small and numerous as to give a furry appearance to the skin, those on ventral surface slightly smaller than on the dorsal; subopercular processes and rostral spine obsolete.

Insertion of dorsal midway between tip of snout and tip of caudal, rays very slender; caudal 1.63, margin slightly rounded; anal base entirely behind base of dorsal; ventrals 2.72, small, about three-fifths length of pectorals; pectorals 1.75, reaching base of caudal.

Color in alcohol: Dusky olivaceous; fins with blackish margins, central basal portion whitish, except the ventrals, which are black.

*Type*.—Cat. No. 70278, U.S.N.M., 5.3 cm. in length, taken with a beam trawl at station 5607 (lat.  $0^{\circ} 04' 00''$  S.; long.  $121^{\circ} 36' 00''$  E.), near Binang Unang Island, Gulf of Tomini, Celebes, in 761 fathoms, on a bottom of fine sand.